Obituary

Professor Emeritus
Dr. HANAI, Tetsuya (1927–2017)

Dr. Tetsuya Hanai, Professor Emeritus of Kyoto University, passed away in Uji on December 12, 2017, at the age of 90.

Dr. Hanai was born in Tokyo on May 23, 1927. In 1951, he graduated from Kyoto Imperial University with a major in Physics and joined the Institute for Chemical Research (ICR), Kyoto University, where he started his studies on the dielectric properties of colloidal materials under the supervision of Professor Rempei Gotoh. After having received his PhD (Doctor of Science) from Kyoto University in 1961, he had an opportunity to spend for three years at the Department of Colloid Science, the University of Cambridge. In 1966, Dr. Hanai was appointed to an Associate Professor of ICR and was promoted to a Full Professor in 1985 in charge of the Laboratory of Dielectrics. In 1991, he retired after forty years of service at Kyoto University to be honored with the title of Professor Emeritus of Kyoto University.

Dr. Hanai's professional career covers a wide range of colloid chemistry and dielectrics, but his research interests have focused on the dielectric properties of heterogeneous systems as well as theoretical considerations of interfacial polarization. His early work concerned the dielectric properties of emulsions, which were successfully explained by his own dielectric theory for concentrated particle suspensions. The studies have advanced our knowledge on the dielectric behavior of heterogeneous systems, and his theory has been widely accepted to be called Hanai's mixture theory. Later, with Dr. Akihiko Irimajiri, Dr. Hanai extended his studies to the field of bio-dielectrics. They proposed sophisticated models for biological cells and intracellular organelles such as the so-called double-shell and multi-stratified shell models. These models have become indispensable for characterizing biological cells in dielectric studies. Moreover, dielectric analysis was performed on various industrial membranes such as reverse osmosis and ion-exchange membranes, giving us great insight into the heterogeneous structures related to the membrane functions.

Dr. Hanai is also widely recognized for his pioneering studies on black lipid membranes. During his stay at Cambridge, in co-operation with Dr. Denis A Haydon, he developed techniques to construct the black lipid membranes and measured their electric properties. The studies contributed much to the modeling of the physicochemical properties of biological membranes. Important findings were that the capacitance of the membranes was independent of the nature and concentration of the surrounding electrolyte and that only the hydrocarbon part of the membranes contributed to the capacitance. He verified that the thickness of the hydrocarbon part estimated from the capacitance was twice the average hydrocarbon chain length of lipids.

In addition to these excellent research achievements, his activities in education and academic society are noteworthy. He gave lectures on advances in dielectric spectroscopy of colloidal systems at the Graduate School of Science, Kyoto University and supervised the dissertation work of many graduate students. He also provided lectures on selected topics as well as physical chemistry and colloid chemistry at several different universities. He has published many review articles and books that provide an easy-to-understand introduction for students and young researchers who are interested in the electric properties of heterogeneous systems including colloids, biological cells and membranes. He served as an active member of academic societies such as the Division of Colloid and Surface Chemistry in the Chemical Society Japan and the Membrane Society of Japan.

Dr. Hanai is respected by his students and loved by his colleagues for his sincere and warm personality as well as his scientific talent.

Obituary

Professor Emeritus
Dr. BANDO, Yoshichika (1934–2018)

Dr. Yoshichika Bando, Professor Emeritus of Kyoto University, passed away on February 7, 2018, at the age of 84.

Dr. Bando was born in Tokushima on January 15, 1934. After graduation from the Faculty of Science, Kyoto University in 1956, he continued his study as a graduate student at the Department of Chemistry, Faculty of Science in Kyoto University. After finishing the graduation course, he joined Nippon Kayaku Co., Ltd., and then entered a doctoral course of Department of Chemistry, Graduate School of Science, Kyoto University. In 1960 he was appointed an instructor of the Department of Chemistry, Faculty of Science, Kyoto University under the supervision of Professor Sukeji Kachi. He was granted a doctoral degree for his studies on the preparation and properties of ultrafine particles of metal alloys. In 1964 he was appointed an instructor of the Laboratory of Solid State Chemistry of the Institute for Chemical Research, Kyoto University under the supervision of Emeritus Professor Toshio Takada. In 1968 he was promoted to Associate Professor of the same laboratory. In 1976 Dr. Bando was appointed full Professor of Kyoto University and directed the Facility of Inorganic Synthesis of the same institute. Dr. Bando retired from Kyoto University on March 31, 1997, and was honored with the title of Professor Emeritus, Kyoto University. After retirement, he was appointed as a professor of the Faculty of Engineering, Okayama University of Science.

During years Dr. Bando's research work covered a wide range of solid state chemistry. He studied the Martensitic transformation of fine particles of metal alloys, various synthesis methods of oxides and hydroxides of transition metals, growth of single crystals by the chemical transport, and also growth of epitaxial films and artificial superlattices of oxides and chalcogenides. Basic research done by him found fruitful practical applications; e.g. production of iron oxide fine particles to be used as magnetic recording materials, cosmetics and magnetic heads made of a crystal-oriented spinel ferrite. Dr. Bando also rose into worldwide notice for his outstanding work about the epitaxial films and artificial superlattices of high-Tc cuprate superconductors.

Dr. Bando was awarded several prizes for his brilliant achievements by The Japan Society of Powder and Powder Metallurgy.

Dr. Bando delivered lectures on advanced inorganic synthesis at the Graduate School of Science at Kyoto University and supervised dissertation works of graduate students. He was invited as a visiting professor by the University of Tokyo, Nagoya University, Kobe University, and some other institutions. He served as a president of The Japan Society of Powder and Powder Metallurgy from 1996 to 1998, and as a director or a councilor of several other societies.

His sincere and warmhearted character was admired by his friends, colleagues, and students.